

REMARKS

The present amendment is submitted in response to the Office Action mailed November 1, 2005. Claims 1-10 are currently pending in the application. No new matter or issues are believed to be introduced by this amendment. In view of the remarks to follow, reconsideration and allowance of this application are respectfully requested.

35 U.S.C. §103(a)

Claims 1-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,607,229 - hereinafter Rykowski.

Applicant respectfully submits that these claims are deemed patentable for at least the reasons given below.

Regarding Claim 1, Applicant respectfully submits that Rykowski does not teach not teach Applicant's luminaire as set forth in Claim 1.

In the Office Action, the Examiner alleges, per claim 1, that Rykowski teaches or discloses, "a luminaire comprising a multi-sectored light-directing element having a light emission window for directing light from an electric light source to a system which employs the light (a display system, a projection system, automobile headlights, etc.). The shape of the light-directing element being composed of n solids of revolution of "single circularly symmetric shape" forming an integral surface, the shape being calculated to take into account that the light source may be voluminous (i.e., has a large circular cross-section). Rykowski does not disclose that the light directing element directs the light into an optical fiber system. The Examiner alleges that it would have

been obvious to use the Rykowski multi-sectored light-directing element for directing the light into an optical fiber system. The Applicant respectfully disagrees.

The object of the illumination system of Rykowski is taught at Col. 2, lines 30-50 of Rykowski, wherein it states –

The primary object of the present invention is to provide an improved illumination system which is more efficient than the prior art systems, provides increased control over the uniformity of projected light, and which provides increased angular distribution of the light.

A more specific object of the invention is to provide an illumination system which includes an asymmetrical projection reflector which is constructed to match the output luminous flux cross section of the reflector with a non-circular aperture, which improves efficiency, and furthermore which allows greater control over uniformity of the light incident at the aperture. The reflector of the present invention is not limited to LCD projection systems, although it does offer advantages for LCD projection systems since the LCD aperture is usually rectangular. The present invention does, however, have an added advantage for LCD projection in that greater control over incident angle can be achieved with a surface-of-revolution feature incorporated into the reflector. [Emphasis Added]

As disclosed in Rykowski, a specific object is to *match the output luminous flux cross section of the reflector with a non-circular aperture to improve efficiency and allow greater control over uniformity of the light incident at the aperture.*

To carry out the object of the invention of Rykowski, various surface elements of the reflector surface of the reflector are tilted and rotated with respect to a reference surface to direct some of the collected light toward the corner regions of the aperture (see Figs 2 and 3 of Rykowski). Rykowski teaches at Col. 5, a specific example of how various surface elements of the reflector surface of the reflector are

tilted and rotated with respect to a reference surface to direct some of the collected light toward the corner regions of the aperture:

Fig. 3 shows an on-axis ray from a source "a" being reflected from point "b" on the reference reflector surface to a point "c" at the center of the aperture. In the illustrated embodiment, the reference surface element at "b" is tilted through an angle α and rotated through an angle β , with respect to the reference surface by the tilting and rotation of segment 16 so that the normal axis N of the reference surface segment is moved to N' and the reflected ray is deflected to the corner of the aperture 12 at c'. [Emphasis Added]

Claim 1 of the invention recites –

1. A luminaire comprising:
a light-directing element having a light emission window,
said light-directing element having a shape for directing light, which light originates from an electric light source to be accommodated, into an optical fiber system,
characterized in that said shape is calculated in accordance with a ray-tracing algorithm which takes into account that said light source to be accommodated is voluminous.

Applicant respectfully submits that Rykowski does not teach or disclose the characterizing portion of independent claim 1, namely, *characterized in that said shape is calculated in accordance with a ray-tracing algorithm which takes into account that said light source to be accommodated is voluminous*. In fact, Rykowski is silent with regard to considering the nature of the light source in providing an improved illumination system which is more efficient than the prior art systems for providing increased control over the uniformity of projected light, and which provides increased angular distribution of the light. In fact, Rykowski is solely directed to tilting and rotating various surface

elements, as discussed above in the construction of the reflector surface to carry out the objectives of the invention. It is respectfully submitted that the detailed description of Rykowski, at cols. 5 and 6, is silent with respect to teaching or disclosing the calculation of a shape which takes into account the fact that the light source to be accommodated is voluminous, as recited in claim 1.

Applicant's invention is further distinguishable from Rykowski for the following reason. It is respectfully submitted that while Rykowski is solely directed to tilting and rotating various surface elements, as discussed above, in the construction of the reflector surface to carry out the objectives of the invention. The invention calculates a surface construction via a more global modification of an entire segment. This is supported throughout the specification (e.g., see par. 24) and also in claim 3.

3. (Original) A luminaire according to claim 2, characterized in that the parabolic sectors are parts of parabola defined by the following set of equations:

$$a(i) = (z(i) - z(i + 1)) / (x(i)^2 - x(i+1)^2)$$

$$b(i) = a(i)$$

$$c(i) = (x(i)^2 * z(i + 1)) - ((x(i + 1)^2 * z(i)) / (x(i)^2 - x(i + 1)^2))$$

wherein:

$a(i)$, $b(i)$ and $c(i)$ are polynomial coefficients of the parabolic sectors such that coordinates of each point of the reflective surface fulfill the condition:

$$a(i)*x^2 + b(i)*y^2 - z + c(i) = 0;$$

x , y , z are coordinates of the i^{th} surface of revolution of the parabola in a linear x , y , z tri-coordinate system;

the coordinates $x(i)$, $z(i)$, $x(i+1)$, $z(i+1)$ are limits of the i^{th} parabolic sector in a plane xz ;

i is an integer from 1 to n.

As discussed above, it is shown that there is no tilting or rotating of particular target points on the various surface elements, as taught in Rykowski. Rather, the parabolic sectors are defined by a particular set of equations, such that coordinates of each point of the reflective surface fulfil the same condition, namely, $a(i)*x^2 + b(i)*y^2 - z + c(i) = 0$.

It is respectfully submitted that at least the limitations and/or features of independent Claim 1 is not anticipated by the disclosure of Rykowski.

Accordingly, withdrawal of the rejection under 35 U.S.C. §103(a) with respect to Claim 1 and allowance thereof is respectfully requested.

Additionally, Claims 2-10 depend from independent Claim 1 and therefore contain the limitations of Claim 1. Hence, for at least the same reasons given for Claim 1, Claims 2-10 are believed to be allowable over Rykowski.

Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-10 are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call Frank Keegan, Esq., Intellectual Property Counsel, Philips Electronics North America, at 914-333-9669.

Respectfully submitted,



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